

# MATERIAL SAFETY DATA SHEET

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## 1. SUBSTANCE AND SOURCE IDENTIFICATION

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National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2300  
Gaithersburg, Maryland 20899-2300

SRM Number: 1053a  
MSDS Number: 1053a  
SRM Name: Cadmium Cyclohexanebutyrate

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**Description:** This Standard Reference Material (SRM) is primarily intended for use in preparing standard oil solutions containing cadmium. It is essentially free from other metals and has suitable solubility, compatibility, and uniformity for use with most lubricating oils or petroleum products. Each unit consists of 5 g of material, with a certified cadmium content.

**Substance:** Cadmium Cyclohexanebutyrate

**Other Designations:** Cadmium bis(4-cyclohexanebutyrate); cyclohexanebutanoic acid, cadmium salt.

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## 2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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<b>Component:</b>	Cadmium Cyclohexanebutyrate
<b>CAS Number:</b>	55700-14-6
<b>EC Number (EINECS):</b>	269-767-7
<b>Nominal Mass Fraction (%):</b>	25
<b>EC Classification:</b>	T (Toxic); not classified in Annex I of Directive 67/548EEC
<b>EC Risk:</b>	R45 (may cause cancer) R26 (very toxic by inhalation) R48/23/25 (toxic, danger of serious damage to health by prolonged exposure)
<b>EC Safety:</b>	S53 (avoid exposure – obtain special instructions before use) S28 (wash after contact with skin) S45 (in case of accident or illness, see doctor; show label)

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## 3. HAZARDS IDENTIFICATION

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<b>NFPA Ratings (Scale 0-4):</b>	Health = 3	Fire = 0	Reactivity = 0
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**Major Health Hazards:** Cadmium and its compounds are known human carcinogens. This material may also damage the lungs, kidneys, liver, and male reproductive tract.

**Physical Hazards:** Container may break.

## Potential Health Effects

<b>Inhalation:</b>	Cadmium compounds can irritate the upper respiratory tract, causing chemical pneumonitis, pulmonary edema, rapid heartbeat, difficult breathing, convulsions, and death. Chronic exposure to cadmium can cause bronchitis, emphysema, abnormal lung function, and possible fibrosis. Symptoms of exposure may include ulceration of the nasal septum and yellow discoloration of the teeth.
<b>Skin Contact:</b>	Contact with this material can cause skin irritation.
<b>Eye Contact:</b>	Contact with this material can cause eye irritation.
<b>Ingestion:</b>	Ingestion of cadmium can cause permanent kidney damage. Occupational exposure to cadmium is associated with cancer of the lung, prostate, and liver. Chronic exposure may also damage the skeleton. Symptoms of exposure may include abdominal pain, vomiting, and dizziness.

**Medical Conditions Aggravated by Exposure:** Cadmium may aggravate osteoporosis and any disorders affecting the lungs, prostate, kidneys, or other target organs. Since tobacco is a significant source of cadmium exposure, smokers should avoid compounding the risk by occupational exposure. Pregnant women should also avoid exposure to cadmium because it can cause birth defects. Cadmium uptake is increased in persons with iron deficiency.

### Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<u>X</u>	_____
In the International Agency for Research on Cancer (IARC) Monographs	<u>X</u>	_____
By the Occupational Safety and Health Administration (OSHA)	<u>X</u>	_____

**Note:** Cadmium and cadmium compounds are listed by NTP and IARC as known human carcinogens.

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## 4. FIRST AID MEASURES

**Inhalation:** Move the person to fresh air immediately. If not breathing, qualified personnel may start CPR or give oxygen if necessary. Get medical aid at once, and bring the container or label.

**Skin Contact:** Remove contaminated clothing and shoes. Flush affected skin with water for at least 15 minutes, then wash thoroughly with soap and water. If skin irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

**Eye Contact:** Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 30 minutes, keeping eyelids open and raising lids to remove all chemical. Get medical aid at once, and bring the container or label.

**Ingestion:** Contact a poison control center immediately for instructions. Wash out mouth with water, but do not induce vomiting. Get medical aid at once, and bring the container or label.

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## 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** This material is not believed to be a significant fire or explosion hazard, but dust-air mixtures may ignite or explode. See also Section 10, Incompatible Materials.

**Extinguishing Media:** Use extinguishing media appropriate to the surrounding fire: water spray, dry chemical, carbon dioxide, or foam. Use a water spray to cool containers.

**Fire Fighting:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** N/A

**Autoignition (°C):** N/A

**Lower Explosive Limit (LEL):** N/A

**Upper Explosive Limit (UEL):** N/A

**Flammability Class (OSHA):** N/A

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## 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Isolate the spill area and remove any sources of ignition. Cleanup personnel must wear personal protective equipment (Section 8). Sweep up material and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

**Disposal:** Refer to Section 13, Disposal Considerations.

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## 7. HANDLING AND STORAGE

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**Storage:** Store this material in the original container at room temperature. Protect from moisture, heat, and physical damage, and isolate from incompatible materials.

**Safe Handling Precautions:** Wear a dust mask or respirator. Avoid contact or wash after handling.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### Exposure Limits (Cadmium Fume):

ACGIH TWA-TLV: 0.002 mg/m<sup>3</sup>

OSHA PEL: 0.005 mg/m<sup>3</sup>

UK WEL-TWA: 0.025 mg/m<sup>3</sup>

**Ventilation:** Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

**Respirator:** If necessary, refer to the NIOSH document *Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

**Eye Protection:** Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

**Personal Protection:** Wear appropriate gloves and protective clothing to prevent contact with skin.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Component:** Cadmium Cyclohexanebutyrate

**Appearance and Odor:** White crystals, odorless

**Relative Molecular Weight:** 450.9

**Molecular Formula:** (C<sub>6</sub>H<sub>11</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>COO)<sub>2</sub>Cd

**Density (g/cm<sup>3</sup>):** N/A

**Solvent Solubility:** N/A

**Water Solubility:** Negligible

**Boiling Point (°C):** N/A

**Melting Point (°C):** N/A

**Vapor Pressure (Pa):** Negligible

**Vapor Density (Air = 1):** 15.6

**pH:** N/A

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## 10. STABILITY AND REACTIVITY

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**Stability:**    ☒ Stable                      ☐ Unstable

Stable at normal temperatures and pressure.

**Conditions to Avoid:** Dust generation; incompatible materials.

**Incompatible Materials:** Strong oxidizers

**Fire/Explosion Information:** See Section 5.

**Hazardous Decomposition:** Thermal decomposition of this material may produce carbon oxides (CO, CO<sub>2</sub>) and toxic cadmium oxide fumes.

**Hazardous Polymerization:**    ☐ Will Occur    ☒ Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:**    ☒ Inhalation                      ☒ Skin                      ☒ Ingestion

**Toxicity Data:** No toxicity data are available for this cadmium compound. Data for cadmium:

Rat, oral: TD<sub>Lo</sub> (13 weeks) = 155 mg/kg

**Target Organ(s):** Respiratory tract, male reproductive tract (prostate), skin, eyes, mucous membranes, kidneys, liver, skeleton.

**Mutagen/Teratogen:** Like many carcinogens, cadmium and its compounds can cause mutations and birth defects.

**Health Effects:** See Section 3.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data (Cadmium):**

Eastern narrow-mouthed toad (*Gastrophryne carolinensis*): LC<sub>50</sub> (7 days) = 40 µg/L

Porgy (*Acanthopagrus schlegeli*), juvenile: LC<sub>50</sub> (24 hrs) = 8,300 µg/L

American eel (*Anguilla rostrata*): LC<sub>50</sub> (96 hrs) = 820 µg/L

Carp (*Cyprinus carpio*), fry: LC<sub>50</sub> (96 hrs) = 4,260 µg/L

**Environmental Summary:** This material may be toxic to aquatic organisms. Do not release to the environment.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location. Although this material is not a listed RCRA hazardous waste, it may exhibit one or more characteristics of a hazardous waste and thus requires appropriate analysis to determine specific disposal requirements. Processing, use, or contamination of this product may change the waste management options.

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## 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA (Cadmium Compound):** Not regulated.

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): No RQ assigned (Cadmium Compounds, N078)

SARA Title III Section 302: Not regulated

SARA Title III Section 304: Not regulated

SARA Title III Section 313: Regulated (as Cadmium Compounds, N078)

OSHA Process Safety (29 CFR 1910.119): Not regulated

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes
CHRONIC:	Yes
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

### STATE REGULATIONS

California Proposition 65: Regulated

### CANADIAN REGULATIONS

WHMIS Classification: D2B (toxic)

WHMIS Ingredient Disclosure List: Regulated (as Cadmium Salts, n.o.s.)

CEPA Domestic Substances List (DSL): Regulated

### EUROPEAN REGULATIONS

EU/EC Classification: T (Toxic); not classified in Annex I of Directive 67/548EEC

### NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed

TSCA 12(b), Export Notification: Not listed

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## 16. OTHER INFORMATION

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### Sources:

Amdur M.O., et al., *Casarett and Doull's Toxicology: The Basic Science of Poisons*. 4th Ed. New York: McGraw-Hill, 1993.

IARC Substance Profile: Cadmium.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, June 1990 edition. DHHS (NIOSH) Publication No. 90-117.

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.